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ABSTRACT

This strategic plan provides a broad template of strategies for improving and strengthening technology throughout the California Community College system. Challenges facing California community colleges today include an increased enrollment demand; the explosive use of the Internet and computers as a required occupational and citizenship skill; the digital divide; an increased demand for the integration of technology in teaching; the sustainability of technology infrastructure; the need for adequate levels of intra-campus and inter-campus connectivity; and the need to provide accessibility for persons with disabilities. This plan focuses on two major goals: (1) promoting student access to community colleges, instruction, and student support services; and (2) promoting students' success in their educational and career goals. The colleges will use technology to enable students and communities to be successful in a knowledge-based society by providing universal access to quality learning. Current investment in technology is insufficient to meet these goals. The colleges require a substantial infusion of funds to meet the growing technological needs of students, faculty, and staff. This plan would provide additional resources into the system's base each year for 5 years. The funding of this plan would involve a collaborative effort of the state and the private sector. (KP)

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TECHnology://

strategic plan
2000 - 01 / 2005

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Prepared by the Instructional Resources and Technology Unit
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EXECUTIVE SUMMARY

The California Community Colleges face compelling challenges in serving the students of today:

- the explosive use of the Internet as a required occupational and civic skill;
- the Digital Divide;
- the necessity for integration of the new technology into teaching and learning;
- the impact of TidalWave II on demand for college access; and
- ensuring that technology is accessible to persons with disabilities.

The vision for the use of technology is that the California Community Colleges will use it to enable students and communities to be successful in a knowledge-based society by providing universal access to quality learning.

This Technology Strategic Plan focuses on two major goals:

Student Access – Promote student access to the California Community Colleges by fulfilling access to instruction and student support services.

Student Success – Promote students' success in their educational and career goals.

The cost estimate for this Technology Plan is based upon a Total Cost of Ownership model, which includes not only hardware and software but also the necessary components of support staffing and staff development. Community colleges are investing over $73 million per year in telecommunications and technology, or $73 per FTES, but it is not enough to meet the goals identified in this Plan. This will require a substantial infusion of funds in order to meet the technology needs of students, faculty and staff. This Technology Plan will require additional resources of approximately $182 million per year for five years. The Technology Plan was developed with the participation of two major stakeholder groups: the [illegible]

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PREFACE

The California Community Colleges Technology:// Strategic Plan provides the broad template of strategies for improving and strengthening technology through-out the California Community College system. The Board of Governors recognizes that the Tech:// Plan will guide a complex undertaking to be implemented in a changing environment.

Consequently, some of the pieces of the Tech:// Plan will require further discussion and development as they are implemented. Accordingly, the Board of Governors adopts the California Community Colleges Technology:// Strategic Plan, 2000-2005, with the understanding that it will be subject to ongoing evaluation and review, using the system's established consultation process.

VISION FOR TECHNOLOGY IN THE CALIFORNIA COMMUNITY COLLEGES

Technology is changing the world—including many aspects of education. The Internet and other information and communications technologies are changing the way people work, learn, communicate with each other, and do business. These technologies are shaping the economy and society in the same way that the steam engine and electricity defined the Industrial Age. The world is becoming increasingly digital, and higher education must upgrade its infrastructure and business practices to take advantage of the speed and benefits of digital technology.

The California Community Colleges (CCCs) are using technology to enable students to be successful in their academic careers, as citizens and as workers in a knowledge-based society. The CCCs provide universal access to quality education, as evidenced by this mission statement:

 To provide open access to academic and vocational instruction at the lower division level for both younger and older students, including those persons returning to school, as well as to advance California's economic growth and global competitiveness through education, training, and services that contribute to continuous work force improvement.

In recent years, information technology has driven the U.S. economy. Businesses are scrambling to use the Internet to increase productivity, boost exports, cut the time required to develop new products, and forge closer relationships with customers and suppliers. The current federal administration has pursued a marketed approach to global electronic commerce that relies whenever possible on private sector leadership and seeks to eliminate legal and regulatory barriers to electronic commerce while protecting the public interest.

The California economy has been driven by information technology (IT) even more than has the national economy. California is a technology state, serving as the birthplace of many of the discoveries leading to the information age, and home to many of the major companies involved in creating this new future. Technology firms continue to be major employers within the state, and many technology-based occupations remain under-staffed for the lack of skilled workers. This IT-driven economy has placed some unprecedented responsibilities on the community colleges in responding to the state's needs for an educated citizenry.

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As early as 1997, a research report by Rand, "Breaking the Social Contract, The Fiscal Crisis in Higher Education," stated:

> Recent shifts in Californiais economy have made higher education more significant than ever. The industrial jobs that once formed the backbone of the economy are dwindling. The service-related jobs that are taking their place require a level of knowledge and skill that, for the most part, can be gained only through programs offered at Californiais colleges and universities. If workers in todayis economy are cut off from higher education, they will be unable to attain the proficiency levels needed to master new technologies and enter new occupations. [p. 4]

The Digital High School Program (AB 64, Statutes of 1997) requires that all high schools in the state become "digital high schools" by the end of the first decade of the 21st century. It requires that these schools fully integrate computers, networks, training and software to achieve computer literacy in all pupils and faculty, and to improve academic achievement. Sixty-six percent (66%) of California Digital High School students who attend a public California college or university after high school graduation will attend a California Community College.

Scott A. Langhorst, "Changing the Channel: Community Colleges In The Information Age," states that "community colleges must chart a new course using technology to navigate through the shoals of access, accountability, diversity and quality."[Vol. 25, no. 3, p. 55 (1997)] The colleges must be prepared to serve these students, as well as their older counterparts seeking training and education, with state-of-the-art classrooms and student support services, and skilled faculty and staff.

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TECHNOLOGY CHALLENGES FACING THE CALIFORNIA COMMUNITY COLLEGES

This Tech II Plan addresses itself to critical technology challenges facing the California Community Colleges.

Technology in California- In California, even more than in the rest of the United States, familiarity with the use of computers is fundamental to economic success. As noted above, California is a technology state, serving as the birthplace of many of the discoveries leading to the information age, and home to many of the major companies involved in creating this new future. Therefore, it is no longer viable to expect California Community College students to function without a baseline of networks, hardware and software similar to what they will confront every day in the workplace.

Tidal Wave II- The California Community Colleges Board of Governors, in California Community Colleges 2005: A Strategic Response for Enabling Community Colleges to Make a Defining Difference in the Social and Economic Success of California in the 21st Century, July 1998, reported that most of the increased enrollment demand for higher education in the 21st century will be served by the community colleges. The report also states that "...the colleges will expand appropriate use of technology in providing support services, performing administrative functions, and in delivering instruction to achieve optimum use in existing physical plant and in best meeting the learning needs of students."

Explosive Use of the Internet- Ability to use the Internet is becoming a required career skill, as a means of communication and an expanded source of information.

Digital Divide- Data from multiple sources make it clear: the Digital Age is having a disproportionate effect within minority and economically disadvantaged populations, and the distance across the divide is increasing. In addition to other issues that face these populations, they experience a significant lack of access to technology. The CCCs must not only provide these students with access to technology, but also ensure that they are able to use technology effectively and that they can adapt to the fast pace of change in the Digital Age.

 Increased demand for the integration of technology in teaching-
The GartnerGroup research showed that the lack of readily available user assistance and support is a primary barrier to the successful adoption of new technology and new technology-enabled methods. Faculty will require assistance in finding the appropriate technology tools to achieve the desired outcomes and in learning to use the tools that are selected. Further, training in the use of the tools must not be limited just to an initial tutorial, but must also include ongoing assistance. The faculty member must be able to focus on the course content and that requires familiarity with the technology.

Sustainability of technology infrastructure- Sustainability is a major challenge facing higher education institutions in the 21st century, that is, keeping the technology current. Obsolete technology, which is common in colleges, is costly to support and it does not represent the type of environment that students will encounter in the workplace. There is also the challenge of ensuring that the underlying technologies of systemwide projects are sound and compatible with future technology directions.

Technology support and staffing- Infrastructure means more than just computers, routers and wiring. Institutions must plan for the support of their technical environments or the result will be networks and computers that fail and faculty, students, and staff who do not know how to use them even when the equipment is working. A sound infrastructure plan must include permanent, qualified support staff on a full-time basis.

 Need for adequate levels of intra-campus and inter-campus connectivity- The California Community Colleges and the California State University (CSU) systems have worked collaboratively to develop and maintain the four-year-old statewide network. This network links the CSUs and the CCCs together into one data/video statewide network. However, the need for access continues to grow exponentially, especially as it relates to Internet access. Already 20 percent of the CCC sites are at capacity as of July 2000. In addition, the individual colleges need to be able to expand their technology infrastructure to take advantage of the systemwide backbone.

Accessibility for persons with disabilities- In 1998, the Office for Civil Rights of the United States Department of Education (OCR) completed a systemwide review of accessibility for blind and visually-impaired students in the California Community Colleges. The OCR directed that in order to satisfy the requirements of the Americans with Disabilities Act, community colleges must ensure that adaptive equipment and software are not confined to High Tech Centers at the colleges. They must be available for use by students with disabilities throughout the campus (in libraries, computer labs, offices, learning centers, and job placement offices). Moreover, OCR requires that newly acquired or developed software and hardware be designed to be accessible for students with disabilities. Critical information conveyed by graphic elements, such as drawings, must be available in an alternative text-based form that is usable by blind and visually-impaired students. Audio information must be captioned for the deaf and screen layout must be designed so students with learning disabilities can use it.

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TECHNOLOGY://
STRATEGIC PLAN

What has the community college system done to address these technology challenges?

<strategic plan> The system and the colleges have been partnering with the state, and with the private sector to meet these challenges. The California Community Colleges telecommunications and technology system was first funded in the 1996 State Budget Act and called the Technology and Telecommunications Infrastructure Program (TTIP). This funding has provided the California Community Colleges with networks and resources that are beginning to meet the needs of faculty, students, and staff, including:

- telecommunications and technology equipment that enable information to be shared between institutions, faculty, students and staff;
- capabilities that help faculty, students, and staff accomplish their tasks better; and
- some human resources technology training.

In particular, TTIP funding has provided the following:

> Linking of the system in four major areas:

- data via connection to the California Community Colleges and California State University network;
- video conferencing capabilities at each college and district site;
- dual satellite downlink capability (analog and digital) for each college and district office; and
- library automation.

> The ability to distribute educational video programming throughout California which is the result of the implementation of a digital satellite uplink site.

> Pilot testing of value added uses of the new network and of approaches to training of faculty and staff in distance education and educational technology.

> Local college improvements in these areas:

- upgrade of obsolete technology,
- instructional network improvements,
- support for educational uses of technology,
- expansion of distance learning classrooms, and
- campus instructional programs.

The California Virtual University serves as a gateway to technology-mediated distance learning courses and programs from the California Community Colleges. It was funded in 1998-99 for $2.9 million, and was designed to work in harmony with the above activities. It is accelerating the development and delivery of distributed learning. It helps colleges to provide a 24-hours-a-day, seven-days-a-week learning environment delivering education to students and training to the workforce anytime, anywhere.

In addition, local colleges have sought to provide technological improvements in such areas as these:

- development and upgrading of instructional computer laboratories;
- some support staffing for laboratories and for faculty training;
- wiring of classrooms to access the Internet; and
- some mobile technology carts and some "smart classrooms."

The colleges have utilized a variety of funding sources in addition to the state TTIP dollars, including:

- apportionment revenue;
- state instructional equipment block grant funds;
- federal grant money;
- local foundation resources; and
- local private sector contributions of equipment and dollars.

Finally, at the system level, the Office of System Advancement and Resource Development and the Foundation for California Community Colleges have worked with the private sector to achieve tremendous cost savings for the colleges through statewide cooperative purchase agreements for purchase of computer hardware and software.

What more is needed to effectively meet the technology challenges?

In spite of the actions noted above, there are serious gaps in the colleges' ability to meet today's technology needs. The Chancellor's Office of the California Community Colleges sought the assistance of the well respected GartnerGroup in assessing the current state of the system. The GartnerGroup's thorough and detailed analysis includes details on the methodology for their investigation.

The gaps identified include these:

- There are significant shortages in the number of computers at many colleges;
- The majority of college PCs are older than three years;
- Few colleges are able to upgrade their computers on a timely or regular basis, which limits the software to which students have access;
- Students must wait in long lines to access open laboratories for doing homework or research on the Internet;
- The level of staff support for assisting students and faculty in using the new technology is sorely limited; and
- Training for faculty and staff does not allow an optimal use of technology. </strategic plan>

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TECHNOLOGY:// GOALS: STUDENT ACCESS AND STUDENT SUCCESS

Based on the analysis, the goals for the system's Technology II Strategic Plan are clear:

Student Access- Promote student access to the California Community Colleges including access to instruction and student support services.

Students will be able to progress into and through the college experience more readily with the assistance of information technology. Students will utilize technology for on-line access to college admissions, support services, faculty, classes, and libraries, in a manner that is fully accessible for all students, including students with disabilities. Emerging technologies and learning practices extend and expand opportunities to meet the educational needs of unserved and underserved populations. Faculty will be better able to integrate technology into instruction to provide alternate educational access to students through distance learning.

Student Success- Promote students' success in their educational and career goals.

Students, faculty, staff and administration will be able to utilize state-of-the-art technology to facilitate their communication in classrooms, laboratories, libraries, learning resource centers, offices, and the workplace and/or the home. Necessary up-to-date adaptive equipment and software will be widely available throughout the college. Faculty will use technology creatively to improve the quality of instruction. They will empower students by permitting greater access to information, and by increasing the variety of learning options. Faculty will be supported by qualified technical staff and training to assist them in promoting student success.

Student Access Objectives

 a. Establish a baseline of access to computers for students, faculty and staff that serve them that includes a technology replacement program for computers and related equipment at all colleges.

b. Support the development of student services technology applications that have systemwide impact.

c. Provide a baseline suite of student support systems and services that would be available, as an option, for each college.

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Student Success Objectives

a. Provide ongoing training for faculty in the use of the information technology tools and provide centralized Web and multimedia hosting sites for all California Community Colleges in one of two course management systems.

b. Expand access to multi-media classrooms and student computer laboratories.

c. Establish and support a baseline of technology infrastructure at every college that will ensure that all students, regardless of disabilities, will receive the benefits from such technology in their student services and instructional programs.

d. Improve faculty and student access to automated library and learning resources including electronic information databases and administrative services.

e. Develop a centralized Web-based resource center for materials, resources and processes with full faculty access to support the best practices in curriculum and instruction.

f. Integrate technology into college offices and support areas to ensure that staff have the tools required to deliver services to students and faculty efficiently and effectively.

g. Improve and maintain systemwide networks to support telecommunication needs of the system; develop and support a technology planning guide and fund the local development of technology plans.

h. Establish a new leadership role in the California Community Colleges Chancellor's Office to carry out the body of work and expectations that are defined in this Tech:// Plan.

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COST TO IMPLEMENT THE TECH:// STRATEGIC PLAN

When educational institutions acquire computer hardware and software, they generally do so without factoring in the costs to support the equipment and infrastructure. As a result, there is often a lack of support to maintain, repair and improve performance of the equipment, as well as a lack of staff for training faculty, staff, and students. This creates delays and inefficient use. The Total Cost of Ownership (TCO) funding concept assumes a relationship between computer hardware/software and support. It is a method of determining the full cost associated with owning and using computers in an educational environment.

The Gartner Group research showed that the initial cost of hardware and software represents only 30 percent of the TCO. GartnerGroup and the Telecommunications and Technology Advisory Committee (TTAC) worked at length to determine the TCO model appropriate for the community college environment.

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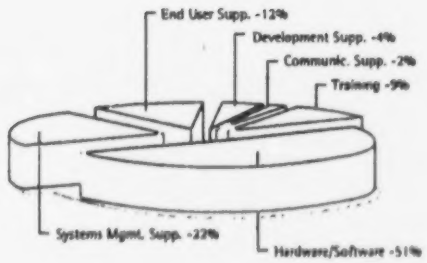
The cost estimate for the technology using the TCO model is $3,506 per PC. Therefore, a TCO computer is one that is funded at a level of support that corresponds to the 19 elements of the TCO model. The TCO model is designed and constructed to be reviewed and analyzed on a continual basis reflecting the ongoing changes and costs as they relate to equipment, software, training, and support personnel. The TTAC will review the model annually to determine adjustments to it as appropriate.

The following graph and table shows the relationship among the various TCO components.



TCO Components	Cost	% of TCO Cost
Hardware and software	$1,794	51%
Systems management support	$ 762	22%
End user support	$ 417	12%
Development support	$ 148	4%
Communications support	$ 60	2%
Training	$ 325	9%
Total	$3,506	100%

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This Technology II Strategic Plan provides a baseline level of technology for students, faculty and staff, including these sorts of features to support the goals of student access and success:

- A ratio of 1 computer for every 20 students;
- Computers for all full-time faculty, adequate access for all part-time faculty, and computers for appropriate administrative and support staff;
- A replacement rate of once every three years for computer replacement;
- Access for students, faculty and staff to printers, the local area network, office and virus protection software, and other key information resources, e-mail, and the Internet;
- Disabled accessible computers at ten percent of all workstations;
- Support staffing for both technical and direct support for students and faculty; and
- Ongoing training for faculty and staff.

The TCO for the California Community Colleges is much lower than the TCO average for the Information Technology (IT) industry of $5,706. The GartnerGroup identified several reasons for this difference:

- The vendors heavily discounted the hardware and software for the CCCs;
- The support levels are lower than the IT industry;
- The salaries of support staff have, historically, been significantly lower than average. This is explained by the CCC's pattern of hiring entry-level IT staff due to budgetary constraints; and
- Most campuses can be classified as only a moderately complex environment, thus not necessitating the same high-end technology required in industry.

While the TCO may seem too low and may not be ideal from an industry point of view, the implementation of this proposed model for funding and budgeting represents a significant improvement over the current state in the California Community Colleges. </param>

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FUNDING THE TECH// STRATEGIC PLAN

Background

Currently, funding for the California Community Colleges occurs within the annual legislative budgeting process with no assured or predictable level of funding for technology initiatives. Many of the system's telecommunications initiatives are large in scale (e.g., data, satellite and video networks) and span several years to implement. Colleges are reluctant to make commitments to permanent IT staff or equipment purchases without multi-year funding. Annual funding is currently handled as follows:

TTIP funds are appropriated by the Legislature at current baseline level categories within three major areas of use:

> Infrastructure: Data, Video, Satellite, and Library Automation

> Applications (Research and Development):

- Telecommunications Model Applications Pilots Projects (TMAPP)
- Telecommunications Systemwide Projects (TSP)

> Training: Human Resources Technology Training Fund and Coordinating Training Center

- The annual Budget Change Proposal (BCP) process is utilized to gain additional funding for the colleges.
- Some TTIP funds are apportioned to specific individual colleges by the Chancellor's Office based on single-year grant projects.

- The individual colleges carry out current technology purchases alone or in collaboration with the Foundation for California Community Colleges negotiated contracts. Cooperative agreements lead to economies of scale, cost reductions, and result in more technology on every college for the same or lower cost. Participation in these blanket purchase agreements is wholly voluntary but requires adherence to established technology standards as approved the Chancellor's Office in concert with the TTAC.

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A New Funding Model

A new approach to funding community college technology initiatives is recommended to ensure the success of the Technology II Strategic Plan:

- The funding structure must recognize the fact that technology investment yields the expected returns only when it is continuous and evolutionary, not episodic and revolutionary.
- As digital delivery comes to undergird every aspect of community college education, funding for technology development at community colleges must be recognized as an essential part of the permanent baseline budget of the system and its colleges.
- A predictable level of funding is equally critical. Stability encourages the colleges to make the required investments in classified staff, technology tools and vendor support needed to maintain the quality and competitiveness of the community colleges.

Adequate support for improving the efficiency of local colleges' administrative services through the use of technology can have a substantial impact upon an important set of services (e.g., financial, student services, and human resources). While the basic infrastructure for student access and student success is being addressed in this Tech II Plan, the issues and questions related to the needs of the administrative system are neither separate nor less important. Quite the contrary, without a viable administrative system infused with technology, the infrastructure for student access and success will not be as effective. The need for local colleges to have their administrative services automated must be a part of future funding in the California Community Colleges.

The Tech II Plan does address some elements of administrative systems. The total of line items, student services support systems and automated library/learning resources, i.e., databases, remote access is $175,439,158. This represents 18.3 percent of the total cost of the Tech II Plan.

Other than those identified above, inclusion in this Tech II Plan of the cost of the administrative systems for the financial, student services, and human resources areas would have significantly increased the cost. In addition, the sequencing of investment requires addressing other needs first so that colleges are technically ready, and the administrative systems can be put to their most effective use. However, if a college met the standards of infrastructure and access in this Technology II Strategic Plan through early local initiatives, it would be beneficial for the colleges' students, faculty and staff for the funds from this Tech II Plan to be used to address college administrative systems needs.

Sources for Funding Technology

A review of other state funding methods indicates there are a variety of ways to fund technology developments in higher education. The most common is through the general apportionment process. Others include fees for services, revenue generation efforts, foundation/private fees, state/federal grants, shareable earnings, and tax levied.

This Tech II Plan assumes shared responsibility for the funding strategies identified in this report. It is recommended that over the life of the Tech II Plan, funding be generated from the following resources:

- New State resources: 80%
- Public/private partnerships: 20%

This implementation strategy would continue the current diverse approach to funding the technology needs of the system while ensuring more sustainable revenues for the community colleges, consistent with the special challenges associated with technology.

New State Resources for Technology

The state funds should be new dollars targeted for technology. The colleges require a substantial infusion of funds in order to meet the growing technological needs of students, faculty and staff. The California Community Colleges would seek collaboration with the Legislature and the business community in establishing a new revenue stream. For example, technology user fees, technology taxes on the information technology industries and increases in state General Fund dollars targeted for telecommunication and technology in the community college could create new technology dollars.

The 1998 data from the national "Campus Computing Survey," conducted by Kenneth C. Green, reveals that more campuses than in previous years of the survey are using technology user fees to help cover rising IT costs. This year, almost half (45.8%) of the institutions participating in the survey report a mandatory IT fee. In the surveyed community colleges, the annual national IT fees averaged $72, an increase from the previous year average of $55. While recognizing this strategy as an option and a trend nationally, the mission of the California Community Colleges to provide access to all that can benefit from instruction runs counter to this approach. The establishment of

students

student technology user fees was considered as an option but is not in alignment with this mission of access and is not a recommended revenue source for funding this Tech II Plan.

Other new state resources could include tax levies on information technology companies, such as an assessment on telecommunications carriers as a part of Public Utilities Commission costs. While state and federal grants may provide brief infusions of funds, they are not considered reliable over the long-term and are not viable sources.

Public/Private Partnerships

State, federal, and industry leaders consider the community colleges a critical player in the economic development of the state. The community college provides technical training and education that support local career market needs. Therefore, it is recommended that 20 percent of the funding for the Technology II Strategic Plan come from public/private partnerships. This represents $190,981,460 over the five-year period. The Foundation for California Community Colleges would lead this centralized, system-wide effort to develop partnerships. Partnerships could secure substantial cost savings, and promote donations in kind and in dollars. With such outside help, every public dollar will go farther in achieving the objectives of this Tech II Plan.

To contribute to this leveraging effect, the Foundation for California Community Colleges would focus on the development of agreements aligned to components of the TCO model in order to achieve additional savings in the hardware, software, and training areas. Agreements would include maintenance provisions negotiated as part of the equipment price and thereby providing additional opportunities to create savings by bundling equipment and service. As stated earlier, the TCO line items represent 39 percent of the total budget. Significant savings in those parts of the TCO that are driven by items the Foundation for California Community Colleges have included in their cooperative purchase agreement program will have a significant impact on private industry's contribution to the investment in technology.

In preparation for their role in securing the 20 percent funding for the Technology II Strategic Plan, the Foundation for California Community Colleges is hiring staff for grant development and increased vendor relationships. This newly acquired staff will

pursue federal and state grants, funding and work to negotiate lower prices for additional cooperative purchases. The Foundation has already witnessed tremendous economies of scale in the new marketplace generated by technology. Technology costs less as the volume purchased increases. An example is the significant savings being passed on to the system as a result of the bundling of software licenses purchases. Currently, two-thirds of the California Community Colleges previous Microsoft expense is being saved by using the Foundation's negotiated agreements. Using this strategy, the system will be able to produce economies in staffing costs through outsourcing opportunities that would lower training costs along with built-in reductions for materials. The bundling of costs will also be able to provide technical support through maintenance contracts, which allows for the use of capital dollars in an area that normally would have used personnel dollars.

The Foundation is also pursuing agreements with vendors who are providing pre-loaded software on their equipment, thereby reducing technical support costs. Additionally, the Foundation is researching new technologies as they emerge that will provide new opportunities for additional cost reductions and savings.

In addition to cooperative purchase agreements, the Foundation for California Community Colleges and the System Advancement and Resource Development Division of the Chancellor's Office would pursue cash contributions and other endowment gifts that would contribute to the amount to be derived from public/private partnerships.

Continuation of the Current Commitments of Colleges to Technology

California's community colleges are already investing substantially in telecommunications and technology, but they are unable to do enough. The California Community Colleges currently report expending over $73,000,000 per year. Colleges make yearly contributions to the cost of tech in such areas as these:

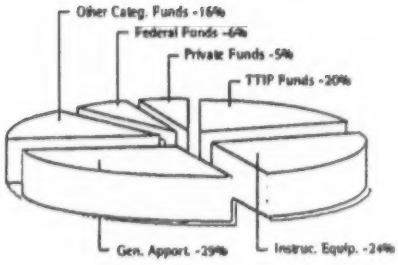
- development and upgrading of instructional computer laboratories;
- some support staffing for laboratories and for faculty training;
- wiring of classrooms to access the Internet;
- some mobile technology carts and some "smart classrooms"; and
- redesign of curriculum to reflect the use of IT in instructional delivery.

In addition to state TTIP dollars, the colleges have utilized a variety of other funding sources:

- apportionment revenue;
- state instructional equipment block grant funds;
- federal grant money;
- local foundation resources; and
- local private sector contributions of equipment and dollars.

It is expected that they would continue these contributions, which would then be augmented from the other two sources described here.

The following graph and table describe college expenditures on technology and the funding sources in their 1998-99 Fiscal Year TTIP Expenditure Reports.



Funding Area	98-99 FY Funds	% of Total Tech Expenditures
TTIP Funds	$14,668,508	20%
Instructional Equipment	$17,656,551	24%
General Apportionment	$21,231,511	29%
Other Categorical Funds	$11,406,341	16%
Federal Funds	$4,187,523	6%
Private Funds	$3,936,375	5%
Total	$73,086,809	100%

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Digital Divide

The Digital Divide is a major challenge for the community colleges. The number of Americans connected to the nation's information infrastructure is soaring. Nevertheless, the National Telecommunications Infrastructure Administration report, Falling through the Net II: New Data on the Digital Divide, July 1998, finds that "a digital divide still exists and, in many cases, is actually widening over time. Minorities, low-income persons, the less educated, and children of single-parent households, particularly when they reside in rural areas or central cities, are among the groups that lack access to information resources." This Tech II Plan will address this challenge by increasing student access to computers on campuses and pursuing a variety of strategies to improve student access to personal computers.

Although the focus of this Tech II Plan is to provide student access to computers on campus, the CCCs are committed to improving student access to personal computers, thereby helping to close the digital divide. There are several ways in which this difficult problem can be approached, and these are being explored at the same time as other possibilities are sought.

> Low-cost opportunities for computer purchase (along with software and internet access) must be made available to all community college students, regardless of academic program or income level. This is possible through contracts currently negotiated by the Foundation, and there is additional potential in this arena.

> The lowest income students must be provided with the means to take advantage of any low-cost purchase opportunities. Given the major increase in Cal Grant funding now under negotiation major increases in these programs in the near future are unlikely. Also, only three percent of CCC financial aid recipients receive Cal Grant funding, so it is not the best vehicle to deliver computer assistance. A massive grant program (through local assistance or another source) is not likely. True progress will probably come through smaller efforts that each meet a portion of the need for various targeted groups. One source is federal student financial aid. Federal regulations allow computer costs in the student "budget"; eligibility is not a problem for needy students regardless of the academic program or educational goal. Lack of funds to meet the needs of all those eligible is the problem. Some funds may be available, as follows:

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- Loan programs are the only significant source of federal student aid available for such budget items. Many campuses do not participate in the loan programs or have default rate concerns or refuse to market student loans. However, for the right student and at the right price, a loan for computer purchase could be a wise investment. This would require a payment plan of at least two installments, due to the nature of student loan disbursal.
- Work programs do not restrict student spending of earnings. A few students might be able arrange a purchase on monthly payments from a workstudy position.
- Grant program dollars may be spent on computers. Students should be advised it is permissible to spend their funds on this item.
- At a minimum, each college should be encouraged to advertise the availability of low cost computers to all financial aid recipients accompanied by a handout describing the loan, work, and grant options available at that campus.

> For vocational students, there may be some funds available through the Workforce Investment Act if local entities put more funds into the Individual Training Accounts. The regulations regarding student eligibility appear to be broad enough to allow such purchase if it is directly related to the program.

> Welfare-to-work support available to Temporary Assistance to Needy Families recipients through the counties does include some book and supply money. For particular vocational programs, there might be some possi-bility of convincing the Department of Social Services to assist with computer purchase.

> A partnership with UC and CSU that targets the information technology needs of the most promising transfer students might yield a small grant or scholarship program from state funds.

> Some business interests might be willing to provide funds to students as "digital divide scholarships" that could be used for yet another small groups of students.

The possibility of federal grants will be explored further, given the federal interest in closing this divide. To date, federal funds seemed more targeted toward technology

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centers rather than individual assistance, but that could change and the California Community Colleges must continue to express the need for funds. Research is needed on the actual extent of the divide and a more precise understanding of the target population. Lack of such research should not deter the effort to provide access to low cost equipment for all California Community College students nor prevent progress on the efforts listed above. Even without specific research in this area it is certain that there is a problem. Some evidence suggests that computer scholarships may be a powerful incentive for retention and/or transfer. Such concepts should also be explored in further research. </digital divide>

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Conclusion

The economic success of the State of California relies on the infusion of technology into the California Community Colleges.

Technological literacy is a survival skill. No academic discipline can claim to provide a strong knowledge base that will sustain success in the constantly changing workplace in the information age. There will be even greater incentive for students to consume higher education in traditional face-to-face and four year classes because learning will be required on a continuous basis in every work setting. Students in the information age must be able to plug into learning, when ever, wherever and however it is required for the job. Learning and training become synonymous in the information age." Source: Lamping, Scott A. 1997. Changing the Channel: Community Colleges in the Information Age." Community College Review. Winter.

Implementation of this Technology II Strategic Plan will permit the California Community Colleges to confront the compelling challenges of serving today's students:

- the explosive rise of the Internet as a required occupational and citizenship skill;
- the Digital Divide;
- the necessity for integration of the new technology into teaching and learning;
- the impact of Tidal Wave II on demand for college access; and;
- ensuring that technology is accessible to persons with disabilities.

The California Community Colleges will use technology to enable students and communities to be successful in a knowledge-based society by providing universal access to quality learning. Students will have ready access to high-touch instruction and high-touch support services, and will be supported by [illegible] and technologies to pursue all of their educational goals and objectives.

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